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Raychem HWAT-T50 User Manual
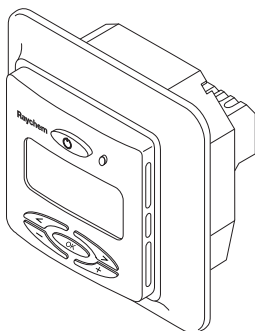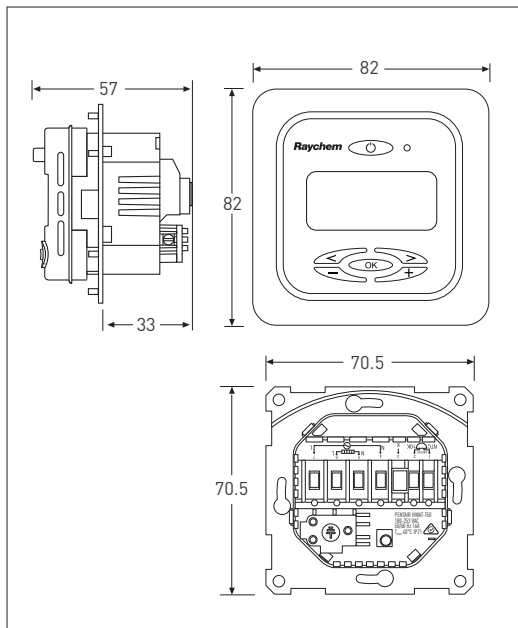
Figure 1

Figure 2

Figure 3

2 DESCRIPTION

The HWAT-T50 thermostat is equipped with a line sensor and is capable of monitoring and controlling Raychem HWAT self-regulating cables for hot water temperature maintenance.

When the heater is energised, the (≝) is displayed.

The HWAT-T50 thermostat is a programmable thermostat with 3 pre-set programs (see Table 1).

For comfort and safety, the thermostat will revert to timer mode if no sensor is detected.

Table 1

Mode	Description	Symbol
Comfort	Comfort mode provides maintenance of a continuous set-point temperature.	**Co**
Economic	Economic mode provides an energy saving setback temperature during the typical working days as well as weekend.	**Econ**
Manual	Manual temperature setting mode.	**Hand**
Off	Off Mode. during Off-mode setting, the controller provides pipe frost protection only.	**OFF**
Timer	In this mode, the thermostat can be adjusted according to customer schedule.	**Tr**

3 MOUNTING AND INSTALLATION

3.1 MOUNTING THE THERMOSTAT

HWAT-T50 thermostat with the adaptor (RPN:1244-010134) can be mounted with the 86 mm wall box for in-wall installation. It should be positioned approximately 1.5 metres above the finished floor, all electrical conduits passing into the wall box that contain cables must also be sealed to protect the thermostat against draughts, e.g. with a piece of insulation in the conduit outlet. The sensor should be placed on the critical branch (like shower) when there are several taps. (Figure 4).
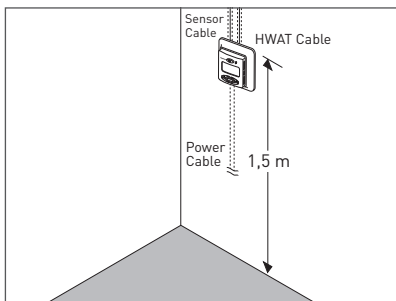

Figure 4

If the HWAT-T50 is mounted in a wall with a rough surface, e.g. bricks, use silicon glue to make a seal between the wall and the thermostat frame.

Note: The HWAT-T50 thermostat can also be mounted on the surface with a junction box (RPN 3000-4791). (Figure 5).
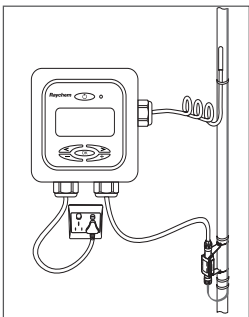
Figure 5

Assembly frame and front of thermostat can be removed by pushing gently with a screwdriver on the two fasteners located on each side of the thermostat (Figure 6).
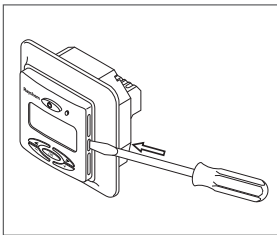

Figure 6

3.2 MOUNTING THE LINE SENSOR

The line sensor should be installed in a separate flexible conduit for easy replacement and in order to avoid signal disturbance resulting in a possible malfunction of the thermostat. For best control performance, position the line sensor as close as possible to the hot water pipe's surface.

Position the line sensor tip opposite of the heating cable on the pipe.

3.3 CONNECTION OF THE THERMOSTAT TO THE POWER SUPPLY

The thermostat must be connected to 180-253VAC according to the circuit diagrams (Figure7).

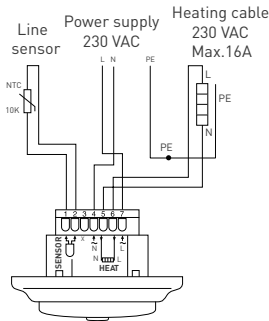**Direct connection – e.g. single heating circuit**

Figure 7

If you connect multiple heating cables, with total run over 50 m HWAT heating cable, you must use a contactor (Normally Open) with integrated suppression device (Figure 8).

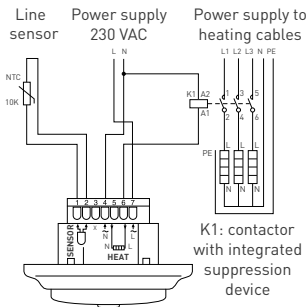**Connection via contactor – e.g. 3 heating circuits**

K1: contactor with integrated suppression device

Figure 8

For the earth connection of the HWAT heating cable, you must use the PE terminal on the thermostat or a separate earth bolt connection.

3.4 PRODUCT SPECIFIC INFORMATION

HWAT-T50 thermostat is compatible with the HWAT self-regulating cable. The self-regulating heating cables have a start up characteristic. In order to guarantee the life time of the thermostat, the maximum load of the self-regulating application in nominal conditions is limited to 50 m.

An over 50 m length self-regulating load will reduce the life time of the HWAT-T50 unless connected as described in figure 8.

4 GETTING STARTED

When powering up the HWAT-T50 for the first time, it will be set as timer mode when no sensor connected, and will be set as comfort mode when sensor connected.

Set the time.
To use the HWAT-T50 thermostat:

- Press ✐ or ✎ to select "hour", "minute" and "day".
- Press ✎ or ✐ to set the value.
- Confirm your selection using ⊂⊃ and switch to the next setting by the sequence of "hour", "minute" and "day".

Figure 9

5 NAVIGATION

The HWAT-T50 thermostat is designed to easily navigate through the different functions.

General principle:

To use the HWAT-T50 thermostat:

- Navigate different functions by using ✐ or ✎.
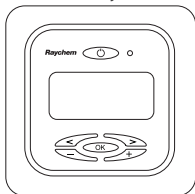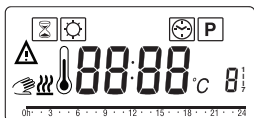- Modify a setting using ✎ or ✐.
- Confirm your selection using ⊂OK⊃.

Figure 10

Figure 11

While scrolling between the functions

- A flashing box denotes the active function navigate between functions using ✐ or ✎.
- By pressing ⊂OK⊃, you activate the new function.

Note: When the blue backlight is not on, the first button you touch will light the blue backlight. The navigation is then activated and only the second time you will hit a button will have an effect on the navigation.

Please refer to the functions in table 2

Table 2

Function	Symbol
Select mode / Back light	⏳
Set temperature	☼
Clock	🕑
Program setting	P
Error symbol and error code	⚠ 88:88 (Shown "Err1, Err2, Err3 add Err4")
Show the pipe temperature	🌡88.88 °C
Show the real time	88:88
Manual mode	✍
Heating symbol	♨
Day of the week	8
Economical mode	1 ¦ 7
The time bar of temperature setting in each day	0h · · 3 · · 6 · · 9 · · 12 · · 15 · · 18 · · 21 · · 24

6 FUNCTIONS

6.1 SELECT MODE AND BACKLIGHT " ⏳ "

To validate your choice, press ◠ and ◡, You will be able to scroll between the S1 ,S2 and END to go to back, press ⊙ to active the selected setting

6.1.1 SELECT MODE

Comfort Mode:

In this mode, the thermostat will run the same

program every day, This schedule can be adapted (see 6.4.1), the factory setting is:

Table 3

Daily	Time	status
	23:30 – 5:00	off
	5:00 -23:30	Comfort Temperature

Economic Mode:

This mode is designed for a home with a working day schedule different from the weekend schedule. This mode is developed in order to minimise the energy consumption when nobody is at home (working hours). This schedule can be adapted (see 6.4.2). The factory setting is:

Table 4

Monday to Friday	Time	status
	23:30 – 5:00	off
	5:00 -9:00	Comfort Temperature
	9:00 -11:00	off
	11:00 -13:00	Comfort Temperature
	13:00 -16:00	off
	16:00-23:30	Comfort Temperature
Saturday to Sunday	23:30 to 5:00	off
	5:00 to 23:30	Comfort Temperature

Manual mode:

This mode will always maintain the set temperature.

Off Mode:

The system will be switched off.

Timer Mode:

This mode will operate as the following, this schedule can be adapted (see 6.4.3):

Table 5

Daily	Time	status
	23:30 – 5:00	off
	5:00 -23:30	on

6.1.2 BACKLIGHT ON DURATION SETTING

- Pressing ⟋ or ⟍ to select between OFF and 10''.
- Pressing ⟨OK⟩ to enter and go back to main screen.

6.2 SET TEMPERATURE "☼"

You can define a temperature set point, which will be the set temperature in the comfort, economic, manual mode. Temperature set range: 37°C to 65°C, Factory setting: 50°C. Temperature settings MUST be in accordance with local hygiene standards and guidelines.

To use the HWAT-T50 thermostat:

- Press ⟍ or ⟋ to select between 37°C and 65°C with 0.5°C interval.
- Press ⟨OK⟩ to enter and go back to main screen.

```
┌─────────────────────┐
│  ☼                  │
│                     │
│  65.0  ℃            │
│                     │
└─────────────────────┘
```

6.3 SET TIME AND DAY "🕐"

In this function you can set the time and day of the HWAT-T50 thermostat.

When entering the function, the hours are flashing.

- Press ✑ or ✐ adapt the values.
- Press ✐ or ✑ to navigate between hour, minute and day.
- Confirm your selection ⌫ and switch to the next setting by the sequence of "hour", "minute" and "day".

6.4 PROGRAM SELECTION "P"

To validate your choice and activate the selected program, press ⌫ .You will be able to scroll between the different programs: comfort, Economic and Timer.

6.4.1 PROGRAM COMFORT MODE (Co)

Use:

- ✐ or ✑ to switch it displayed 𝔐 to keeping warm or hidden 𝔐 to keeping off.
- ✑ or ✐ to select the desire time from the 0:00 to 24:00.
- ⌫ to enter and go back to main screen.

6.4.2 PROGRAM ECONOMIC MODE (Econ)

Use:

- ✐ or ✑ to switch it displayed 𝔐 to keeping warm or hidden 𝔐 to keeping off.
- ✑ or ✐ to select the desired time from the 0:00 to 24:00.
- ⌫ Press to enter.
- "Copy" displays if user finishes setting the current day and presses, which means copy the setting of current day to the next day.
- "No" means not to copy to the next day.

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- "End" means stopping programming and going back to main screen.

- Press ⬭ to go back to main screen if setting of Sunday is completed.

6.4.3 TIMER

Use:

- ⬭ or ⬭ to switch it displayed ♨ to keeping warm or hidden to keeping off.

- ⬭ or ⬭ to select the desire time from the 0:00 to 24:00.

- Press ⬭ to go back and enter the main screen.

By choosing "OFF"mode to switch off your heating for a long period of time, while operating in standby, the HWAT-T50 thermostat can be set in frost protection mode.

7 TROUBLE SHOOTING

The below contents are only suitable for the product installed with the sensor before connecting to power.
In the event of damage or malfunction of the temperature sensors, the heating output cuts off (fail safe) and an error code is displayed. The line sensor may be replaced by a new one (RPN: 1244-002952).

Table 6

Number	Error type
ERR 1	Sensor short warning
ERR 2	Senor open warning
ERR 3	Measuring temperature exceeds 70°C
ERR 4	Internal sensor measuring temperature exceeds 70°C
--	Pipe temperature value is less than 0°C

Note: In the event of ERR1, ERR2, ERR3 and ERR4, the heater is de-energised.

8 RESET TO FACTORY SETTINGS

To reset: push the small button on the right side of the power (on/off) switch on the front of the thermostat. All set values will return to factory defaults. The thermostat will re-boot.

9 TECHNICAL SPECIFICATION

Table 7

Supply voltage	180-253VAC ,50/60 Hz
Power consumption, average	6 VA
Main power switch	2-pole
Relay output	230VAC, max. 16A
Ambient temperature – operation	0 +40°C
Ambient temperature – transport	−20 +55°C
Protection class	IP 21
Terminals	Max. 2,5 mm²
Sensor with 3 m cable	NTC, 10KΩ / 25°C
Dimension with frame (Figure1)	H 82 x W 82 x D 57 mm
Colour	Polar white RAL 9010
Display	LCD with blue backlight
Control range	line sensor (0, +70°C)
Temperature setting range	37-65°C (default temperature is 50°C)
Hysteresis	±2°C
Program Selection	3 programs: - Comfort - Economic - Timer
Back-up for set values	Non-volatile memory
Back-up power	Can be used for storing the data of time and date one week

10 APPROVALS AND DECLARATIONS

RCM approved.

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11 ORDER PRODUCTS

For surface mounted installation, please order the two packages for a complete solution:

1.HWAT-T50-A (3000-4790) including the following items:

Name	Description	Quantity
Thermostat	HWAT-T50 Thermostat	1
Sensor	NTC, 10K / 25°C with 3 m cable	1
User manual		1
Self-tapping screw	M3.0*15,with flat hat, fix thermostat into box	2

2. Mounting box for HWAT-T50-A (3000-4791) including the following:

Name	Description	Quantity
Mounting Box	81.5*81.5*54.5	1
M20 Cable gland	For power and heating cable	2
M16 Cable gland	For sensor cable	1

For the flush mounted installation, please order two packages for a complete solution:

1. HWAT-T50-C (3000-4789) including the following items:

Name	Description	Quantity
Thermostat	HWAT-T50 Thermostat	1
Sensor	NTC, 10K / 25°C with 3 m cable	1
User manual		1
Philips screw	Fine thread, M3.7*30	2

2. Adapter front plate for square box (1244-010134)

Name	Description	Quantity
Adapter	For 86mm installation box, white	20pcs/box